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ABSTRACT

A pesticide safety video for children 9-12 years old, "The Playing Field," draws children into the lives of a migrant farmworker family while teaching them about the dangers of pesticides. The video and the lessons are not limited to migrant education, but open a multicultural window for all children, migrant or nonmigrant. Teaching elements for social studies, science, language arts, and health as mandated by the state of Texas are addressed. This integrated curriculum approach is adaptable for team teaching, cooperative learning, and thematic instruction. Five lesson plans address presentation and discussion of the video, production of fruits and vegetables, migrant and seasonal farmworkers, pesticides and their use, and protection against pesticides. Lesson plans contain learning objectives for each main content area, materials, procedures for learning activities, and questions for discussion or writing assignments. The activities in the guide can be utilized for a single lesson or a full week of related activities. There is also a semester-long science project involving growing plants, either indoors or outdoors, with different types of pesticides. A variety of graphic materials accompany the guide and relate to specific lesson plans. A bibliography for student reading and further research is included, as well as other sources of information. (TD)

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A CURRICULUM GUIDE TO PESTICIDE EDUCATION FOR FOURTH, FIFTH AND SIXTH GRADES.



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THE PLAYING FIELD

DIANE BELLISSEMO/DELIANA GARCIA

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THE ♦ PLAYING **FIELD**

A CURRICULUM GUIDE TO PESTICIDE EDUCATION
for
Fourth, Fifth, and Sixth Grades

by
Diane Bellisemo and Deliana Garcia
NATIONAL MIGRANT RESOURCE PROGRAM, INC.
Austin, Texas

September 1994

1994 FIRST EDITION

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ABOUT...

America's Migrant Farmworkers

Federal agencies estimate that as many as five million migrant and seasonal farmworkers labor each year to produce food in the United States. The hours are long and arduous and the wages are low. Entire families often travel and work together in the fields. It is not unusual for them to be compelled to move as many as thirteen times a year to find work. As a result, many farmworker children cannot complete high school. Most farmworkers are U.S. citizens or legal residents, but many are not fluent in the English language. Although the majority of farmworkers in the U.S. are Hispanic, there are also African American, Anglo, Native American, Caribbean and Asian farmworkers. Their cultural backgrounds may be diverse, but they all share the same circumstances in the fields.

Agriculture is one of the most dangerous occupations in the nation. Many of the labor laws which shield workers in other industries do not apply to agricultural workers. Due to exemptions in the law, many growers are not required to provide restroom facilities, drinking water, or handwashing facilities for workers in the fields. Child care facilities are rare, so many farmworkers must take their young children to the field with them. Housing is often located near or even in the fields. This exposes entire farmworker families, both on and off the job, to one of the greatest hazards in agriculture: **pesticides**. Most American crops are regularly treated with powerful pesticides to control loss of yield. Children may have no other playground but the fields, and are tempted to drink or bathe in contaminated runoff water.

The Video: "The Playing Field"

The Environmental Protection Agency estimates that farmworkers suffer 300,000 acute illnesses and injuries from exposure to pesticides each year. Small body mass and metabolic differences make children even more vulnerable than adults to pesticide-induced illnesses. Recognizing the susceptibility of migrant children to pesticide exposure, the EPA commissioned the National Migrant Resource Program to produce "The Playing Field," a pesticide safety video for children nine to twelve years old. The storyline draws children into the lives of a farmworker family while teaching them about the dangers of pesticides. "The Playing Field" opens a multicultural window for all children, migrant or non-migrant, Hispanic or non-Hispanic. Its value is not limited to migrant education. In addition to health and safety messages, "The Playing Field" touches on universal issues of growing up, caring for others, and developing self reliance and deductive reasoning.

The Educator's Guide

Exercises provided in this Guide can be utilized for a single lesson or a full week of related activities. Teaching elements for Social Studies, Science, Language Arts, and Health as mandated by the state of Texas are addressed. Please determine if these criteria qualify in your state.

CURRICULUM APPROACH

This unit was designed for fourth, fifth, and sixth graders. If used as a week-long unit, the five one-class-period lesson plans provide a multidisciplinary curriculum and supply teaching elements for the content areas of Social Studies, Health, Science, and English Language Arts. This integrated curriculum approach is adaptable for team teaching, cooperative learning, and thematic instruction. However, lesson plans are also designed to stand alone, and any of the five plans can be used with the accompanying video, "The Playing Field." A variety of graphic materials accompany this guide which relate to specific lesson plans. These can be photocopied to overhead transparencies and used in discussion and guided practice activities. The following diagrams illustrate the integrated teaching elements related to the lesson plans, and the primary goal of each lesson.

TEACHING ELEMENTS

GRADE LEVELS	CONTENT AREA	TEACHING ELEMENTS
4,5,6	Social Studies (SS)	1. U.S. economic system 2. Local, state, national geography 3. Social studies skills
4,5,6	Health (HL)	Concepts/skills that: 1. Foster personal health and safety 2. Involve interaction between individuals 3. Affect the well-being of people collectively
4,5,6	Science (SC)	1. Acquire data through senses 2. Classify, order, and sequence data 3. Communicate data in oral and written form 4. Draw logical inferences, predict outcomes, and form generalized statements 5. Relate objects and events to other objects and events
4,5,6	Language Arts (LA)	1. Listening and speaking behaviors to receive/produce meaning 2. Vocabulary and comprehension concepts 3. Writing and language concepts and skills

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LEARNING OBJECTIVES BY LESSON PLAN

LESSON PLANS	CONTENT AREA (TEACHING ELEMENTS)	LEARNING OBJECTIVES
Lesson One— "The Playing Field"	Social Studies (3)	Distinguish between personal opinions and factual accounts; compare/contrast opposing viewpoints; interpret visuals
	Health (1,2,3)	Recognize hazards in environment; acquire knowledge to avoid injury; recognize personal responsibility for protecting environment
	Language Arts (1,2,3)	Listen attentively; respond by retelling what was heard; evaluate intent and content of speaker's message; develop vocabulary; identify main ideas
Lesson Two— Fruits and Vegetables	Social Studies (1,2,3)	Describe how transportation contributes to economic interdependence; explain how ways of work have changed; describe various geographical regions, climates, and growing seasons; interpret visuals
	Health (1,2,3)	Recognize interdependence of people and the environment, and personal responsibility for protecting environment
	Science (1,2,3,4,5)	Explore the environment; arrange time, events, and activities in sequential order; classify; predict outcomes, make inferences, draw conclusions
Lesson Three— Migrant and Seasonal Farmworkers	Social Studies (1,2,3)	Describe various geographical regions; describe climates and growing seasons; interpret visuals
	Health (1,2,3)	Recognize interdependence of people and the environment, and personal responsibility for protecting environment
	Language Arts (3)	Determine strategies such as cause and effect; gather information from a variety of sources; write narratives

LESSON PLANS	CONTENT AREA (TEACHING ELEMENTS)	LEARNING OBJECTIVES
Lesson Four— Pesticides and Their Use	Social Studies (1,2,3)	Explain importance of economic interdependence within and among U.S. regions; understand how people adapt to their physical environment; interpret visuals
	Health (1,2,3)	Recognize hazards in environment; acquire knowledge and skills to avoid injury; recognize health of family is dependent upon contributions of each member
	Science (1,2,3,4,5)	Explore environment; make observations from life, the earth, and physical sciences; arrange events and activities in sequential order; describe changes that occur to objects in the environment; compare and contrast objects and activities to daily life
Lesson Five— Protecting Ourselves from Pesticides	Social Studies (3)	Distinguish between personal opinions and facts; compare and contrast opposing viewpoints; organize data to support or refute a viewpoint; interpret visuals
	Health (1,2,3)	Recognize hazards in environment; acquire knowledge and skills to avoid injury; recognize interdependence of people and environment, and personal responsibility for protecting environment

LEARNING OBJECTIVES

Social Studies (SS):	1. Explain the importance of economic interdependence within and among regions of the U.S.; understand economic relationships; identify examples of the factors of production (land, labor, capital, enterprise); describe economic activities; describe how transportation contributes to economic interdependence; explain how ways of work have changed (or not changed) over time. 2. Describe various geographical regions of the U.S., their similarities and differences; understand how people adapt to their physical environment; describe climates (and growing seasons) of various regions of the U.S.; locate major geographical features of the U.S. on maps; describe population patterns and the impact of physical features on selected cultures and their work. 3. Distinguish between personal opinions and factual accounts of events; compare and contrast opposing viewpoints; organize data to support or refute a viewpoint; interpret visuals (pictures, charts, graphs, tables).
Health (HL):	1. Recognize hazards in the environment and acquire knowledge and skills needed to avoid injury and to prevent accidents. 2. Recognize interdependence of people and the environment; recognize personal responsibility for protecting the environment; recognize that the health of the family is dependent upon the contributions of each of its members. 3. Recognize interdependence of people and the environment; recognize personal responsibility for protecting the environment.
Science (SC):	1. Observe phenomena resulting from life, the earth, and physical sciences and explore the environment. 2. Arrange time, events, and activities in sequential order; classify matter, organisms, actions, and events from the environment according to similarities and differences. 3. Describe objects, organisms, and events from the environment; describe changes that occur to objects in the environment.

Science (continued):	4. Predict outcomes, make inferences, and draw conclusions from data; state generalizations about similarities and differences between objects, organisms, and events. 5. Compare and contrast objects, organisms, and events; relate classroom objects, science principles, and activities to daily life.
Language Arts (LA):	1. Listen attentively in different settings for a variety of purposes: gaining information, responding by retelling what was heard, asking questions, contributing information; evaluate the intent and content of the speaker's message. 2. Develop vocabulary and use comprehension strategies to construct meaningful contexts by identifying the purpose and main idea and developing a summary, determining strategies such as cause and effect, predicting outcomes and drawing conclusions, and distinguishing fact from opinion. 3. Use a variety of techniques to select topics and generate ideas; gather information from a variety of sources; write descriptions using spatial order; write narratives to tell stories; classify differences and similarities, advantages and disadvantages, of objects and events.

LESSON ONE—"The Playing Field"

Content Area:

Social Studies:

Health:

Language Arts:

Learning Objectives:

Distinguish between personal opinions and factual accounts, opposing viewpoints; organize data to support viewpoint; interpret visuals.

Personal health and safety; skills involving interaction between individuals; health and well-being of people collectively.

Listening behaviors to receive and produce meaning; vocabulary and comprehension concepts; writing and language concepts.

Materials:

Video player, monitor, and video, "The Playing Field"; discussion questions; vocabulary matching worksheet.

Opening:
(3 min.)

Teacher's Note: It is suggested that the teacher not discuss the story line of the video prior to showing it to the class, but allow the students to sort out the narrative and outcome as part of the learning objective. The teacher may want to explain that this is a video about a boy and his sister whose parents work as farm laborers, making sure students understand that farm work is an occupation.

Activity #1:
(17 min.)

Video Presentation (whole class)

Objective: Students will watch, listen, and at times read (subtitles) to receive and produce meaning from the story.

Procedure: Students should be prepared to watch and listen to the video so they will be able to participate in the discussion of topics related to the story, and to complete the matching vocabulary exercise.

Activity #2:
(10 min.)

Discussion (whole class)

Objective: Students will distinguish between personal opinions and facts, recognize opposing viewpoints, and interpret visuals. Students will respond by retelling what was heard, identifying main idea, and drawing conclusions.

Procedure: A number of discussion questions are included on the following page. The teacher should choose questions and

topics for discussion which are appropriate to each grade level. Students should be encouraged to identify the main problem in the story, gain insight into the lives of migrant and seasonal farmworkers, and understand the major health effects of pesticides. Concentrate on new vocabulary to prepare students for the vocabulary matching exercise that follows.

Activity #3:
(10 min.)

Vocabulary Exercise (small groups)

Objective: Students will develop vocabulary and use comprehension strategies to construct meaningful contexts.

Procedure: Students can be divided into teams, depending on class size and grade level, and a team captain should be appointed. Students work in teams to match the word on the left with the definition on the right. The first team to complete the worksheet should raise hands and send a team captain to the front of the room. Then, the next group to complete the worksheet should follow, and so on. Team captains can lead the identification of the correct responses; teacher can make corrections with input from whole class.

DISCUSSION QUESTIONS

1. Who is the main character in this story? What is his name?
2. Who else was this story about?
3. What kind of work did the children's father do?
4. Where did this family live and work?
5. What happened to Isabel?
6. Why was Isabel's family worried about her?
7. Why did Isabel feel sick?
8. What did Miguel do to help his sister get well?
9. What did Miguel learn in trying to help his sister get well?
10. What did Miguel and his family learn about their home and playground?
11. How are pesticides spread?
12. How do people come into contact with pesticides?
13. What changes did Miguel's parents make in and around the house to protect the family?
(List responses.)
14. What will Miguel and Isabel do differently now to protect themselves? (List responses.)
15. Did you like this story? Would you watch it again?
16. Do you think your parents would enjoy watching it?
17. What did you like best about the story? ...the least?
18. Was there anything in the story you did not understand?

VOCABULARY MATCHING

English:

- | | |
|------------------|--|
| 1. Pesticide | a. Two or more things touching each other |
| 2. Poison | b. Feeling tired or weak from work |
| 3. Symptoms | c. Harmful substance; causes illness, injury, or death |
| 4. Misunderstand | d. Easily affected, sensitive |
| 5. Contact | e. To learn, know, or hear something incorrectly |
| 6. Protect | f. To fall down from dizziness; to "black out" |
| 7. Susceptible | g. Stomachaches, vomiting |
| 8. Fatigue | h. Signs your body gives you when something is wrong |
| 9. Faint | i. Chemical powder or spray that kills insects; is harmful to people |
| 10. Nausea | j. To keep from harm; to make safe |

Spanish:

1. Pesticida
2. Veneno
3. Síntomas
4. Entender mal
5. Contacto
6. Proteger
7. Susceptible
8. Cansancio
9. Desmayo
10. Náusea

Answer key:

1. i; 2. c; 3. h; 4. e; 5. a; 6. j; 7. d; 8. b; 9. f; 10. g

LESSON TWO—Fruits and Vegetables

Content Area:

Social Studies:

Health:

Science:

Learning Objectives:

U.S. economic system; local, state, national geography; interpret visuals (U.S. map).

Foster personal health and safety; healthy interaction between individuals; affect the well-being of people collectively.

Acquire data through senses; classify, order, sequence, and communicate data; draw logical inferences, form generalized statements; relate objects and events to other objects and events.

Note: If you are doing the semester-long science project, Phase I should begin now (see appendix, pg. 43).

Materials:

U.S. map; overlay of locations where certain fruits and vegetables are typically grown; overlay of climate zones that affect growing seasons; overlay of U.S. highways that transport produce.

Opening:
(2 min.)

Ask students to recall the video from the previous day, have them concentrate on the type of work Miguel's father was doing in the field.

Activity #1:
(20 min.)

The Food We Eat (whole class)

Objective: Students will describe various regions of the U.S.; describe climates (and growing seasons) of U.S. regions; locate major geographical features; describe impact of regions on selected cultures and their work.

Procedure: Ask students to name some of the foods they ate for dinner last night, for lunch, for breakfast. List responses on the board under four categories: FRUITS, VEGETABLES, GRAINS, OTHER (dairy, sodas, etc.). Using the U.S. Crop Map, ask students to match the foods listed with the locations where those foods are grown. Using the climate map, ask students to note that certain foods grow in the same temperature "bands" or locations. For example, citrus grows in the tropical region of the southern U.S. from Florida to California; fruit trees and root crops grow in the colder zones of the northern U.S.

Activity #2:
(15 min.)

How Does Food Get from Farms to Our Table? (whole class)

Objective: Students will identify major transportation routes used to deliver fruits and vegetables from fields to homes, and relate this to economic interdependence; students will relate occupations to economic relationships and identify examples.

Procedure:

a. Some produce is harvested by machinery; some fruits and vegetables are too delicate to withstand anything but very delicate treatment. Ask students to compare and contrast the type of crops that could be harvested by machine (wheat, nuts, cotton, corn, rice, potatoes), and those that should be picked by hand (all types of berries: strawberries, blueberries, etc., peaches and other fruits, tomatoes, celery, cucumbers, cabbage, broccoli, lettuce, onions, melons). Make a list on the board or overhead. Those crops that must be picked by hand still need to be packed and loaded into trucks for transport and distribution. Ask students to imagine what the process of getting food from the field to the table would be like without machines such as tractors, harvesters, bailers, combines, threshers, conveyor belts, airplanes (for spraying pesticides).

b. Using the U.S. Highways transparency, ask students to note the general directions of major transportation routes. Distinguish between transportation of produce by train and by truck. Identify the fact that most produce is transported by truck along U.S. Interstate highways. Indicate that trucks bring surplus produce from where it is grown to where it is not grown, and provide an exchange of produce and other crops between regions. Lead a discussion of the various occupational titles of those involved in the process of getting food from the farm to the store to the home; e.g. farmer, farmworker, pilot (pesticides sprayed from the air), trucking company/truck driver, packing company (packers), store owner/manager. Note on the board or overhead the number and variety of the occupations named.

Closing:
(2 min.)

Relationship of Transportation and Economics to Food Production: Review the relationships discussed in Activities #1 and #2, reinforcing the interdependence of objects and events.

HOMEWORK:

As a research project, assign students the task of finding pictures of farm machinery and farm hand tools and determining the name(s) and purpose(s) for each.



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KEY TO CROP SYMBOLS



apples



berries, including
blueberries, cran-
berries, strawberries



cherries



chili peppers



corn



cotton



grains, including
wheat, rice, barley,
sorghum, hay



lettuce



maple products,
including maple
syrup, maple sugar



mushrooms



onions



oranges



peaches



peanuts



potatoes



soybeans



sugar cane



sugarbeets



sunflowers



tobacco

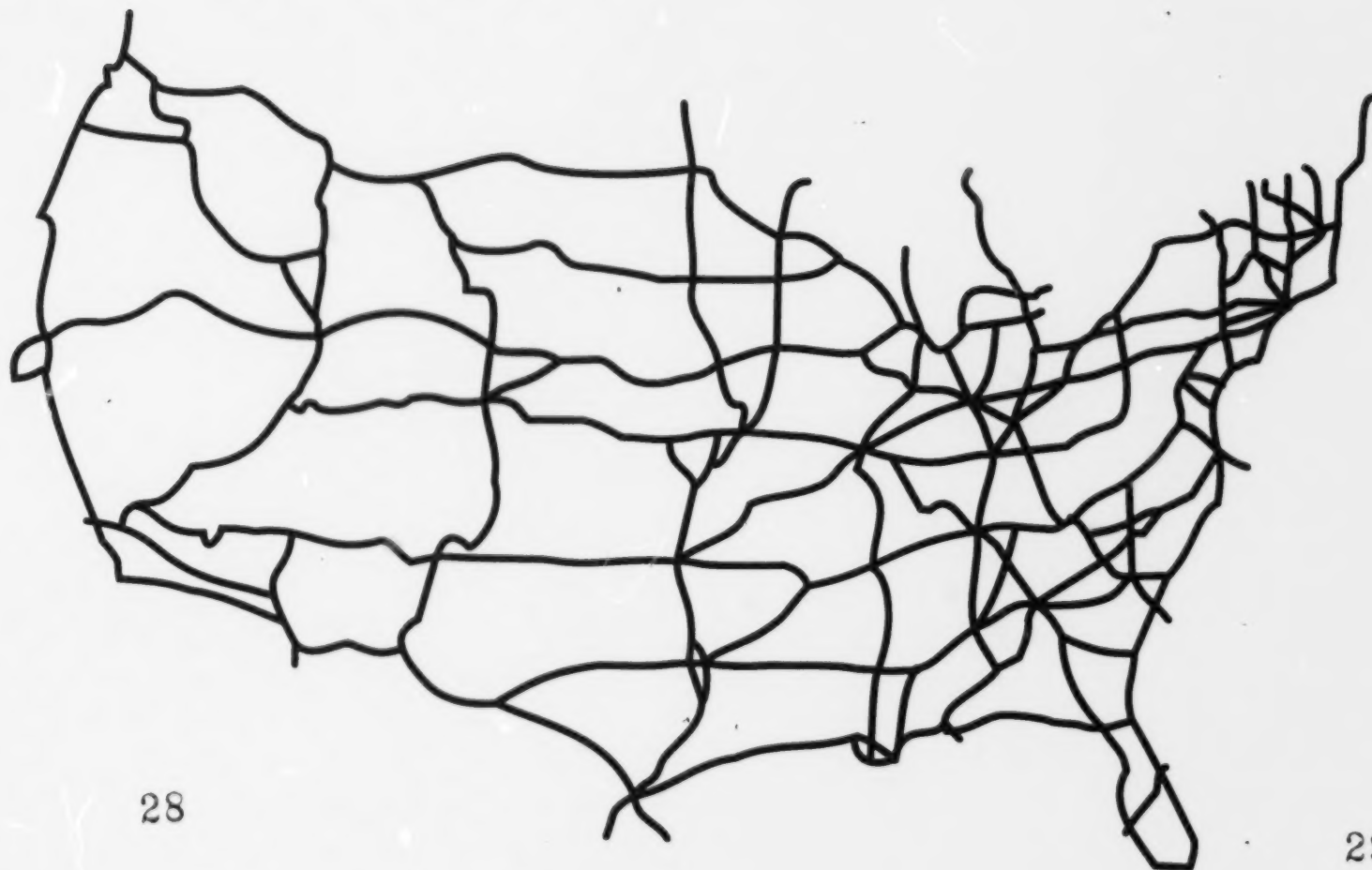


table grapes, wine
grapes



tomato

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LESSON THREE—MIGRANT AND SEASONAL FARMWORKERS

Content Areas:

Social Studies:

Health:

Language Arts:

Learning Objectives:

U.S. economic system; local, state, and national geography; social study skills.

Concepts and skills that foster personal health and safety; involve healthy interaction between individuals; and affect the well-being of people collectively.

Determine strategies such as cause and effect; gather information from a variety of sources; and write narratives.

Materials:

U.S. map overhead transparency; migratory stream map (provided at end of this lesson). (Re-introduce crop map and U.S. highways map).

Opening:
(5 min.)

Introduce the idea of farm work as an occupation, define migrant, distinguish from seasonal, and relate migrant farm work and seasonal labor. (See Definitions in appendix, page 41.) Many families have been migrant and seasonal farmworkers for several generations, much like business owners pass the family business from father to son or daughter to grandchild, etc.

Activity #1:
(15 min.)

Who Are Farmworkers? (whole class)

Objective: Identify examples of the factors of production (land, labor, capital, enterprise); describe how transportation contributes to economic interdependence; explain how ways of work have changed (or not changed) over time.

Procedure: Ask students to identify characteristics of farm work and conditions of leading a migratory life style. Pose the question: If you had to travel the U.S. by car for six months or more each year, and could only take with you one suitcase full of belongings or possessions, what would those items be? Students can either create their own list or call out suggested essential travel items. Use the migratory stream map to illustrate the distances and directions that migrant and seasonal farmworkers travel in order to be employed as much of the year as possible.

Activity #2:
(15 min.)

Where Do Farmworkers Work? What Do They Do? (whole class)

Objective: Acquire knowledge and skills needed to avoid injury and prevent accidents; recognize interdependence of people and the environment; recognize personal responsibility for protecting the environment.

Procedure: Using the migratory stream map, the crop map, and the U.S. highways map, indicate the interdependence among laborers, growers, distributors, the trucking industry, and grocery store owners/managers:

a. Ask students to choose a favorite food item, locate where it is grown on the map in relation to their city/state, and establish an average cost for that item in the grocery store (e.g., a pound of apples, five pounds of potatoes).

b. Role play: Ask for student volunteers to play the part of farmworker, farmer, trucker, grocery store manager, and consumer. Trace the item back through the cycle of production and distribution, and attempt to assign a portion of the cost to each component/occupation. Have students negotiate what portion of the costs they would be willing to earn/buy/pay for that item. Accentuate the fact that each component involves a relationship between people and economics and the land (even if it is the property on which the store is located, or the highway that allows the truck to bring food to the store).

Closing:
(5 min.)

Review the interdependence and the relationships between people (laborers), transportation, localities (the land), and economics.

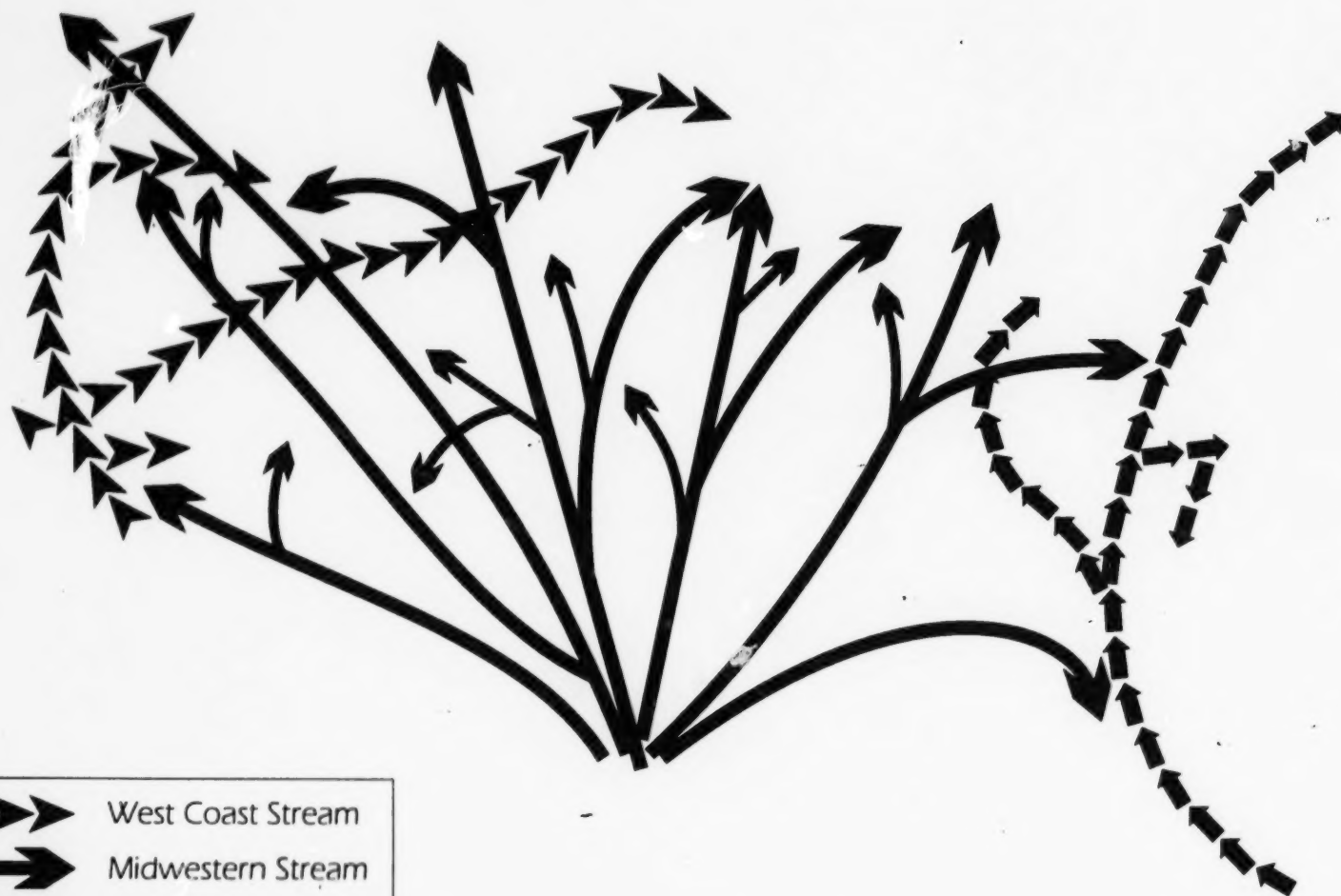
HOMEWORK:

WHAT IF? (see next page)

WHAT IF?

Pretend to be the person in **one** of the following scenarios. Write a two-page essay about what you would do in this situation. You may talk with parents, other family members, and friends to get ideas for your essay.

1. You do not speak much English. You have not been able to find work in your home area and decide to travel by bus to another region in the United States. You have heard there is work in the state of Iowa, and you go to the bus station and buy a ticket to Des Moines. The cost of the ticket is 75% of the money you have, but you are hopeful that you will be working and earning money soon. When you arrive, you discover that Iowa has been devastated by heavy flooding; there is no clean water, no electricity, and no work in the fields and farms since they have all been flooded. What should you do first?
2. You have just finished picking apples in Washington State. The season is over. The money you have left from your last pay is \$100.00. You know you will have to travel at least 500 miles to reach the next area where there is agricultural work. You have a family (a spouse and two children) and a car. How will you budget your money to allow enough for gasoline for the car and food, shelter, and necessities for your family? Set out the categories and assign an amount of money to each category.
3. You have been offered a job picking strawberries in California. The crew leader says you can either be paid by the hour, or by the amount of strawberries you can pick each day. If you choose to be paid by the hour, you will be paid \$4.25 for each hour worked (not including the time it takes to get to and from the field each day). If you choose to be paid by the amount of strawberries you can pick each day, you will be paid \$1.50 per box. Which is the better deal? Assuming you can work a 10-hour day, how many boxes of strawberries will you have to pick to earn more than what you would earn if you were paid by the hour?



LESSON FOUR— PESTICIDES AND THEIR USE

Content Areas:

Social Studies:

Health:

Science:

Learning Objectives:

U.S. economic system; local, state, and national geography; interpret visuals.

Concepts and skills that foster personal health and safety, healthy interaction between individuals, and affect the well-being of people collectively.

Acquire data through senses; classify, order, and sequence data; draw logical inferences; predict outcomes, form generalized statements. Relate objects and events to other objects and events. **Note:** If you are doing the semester-long science experiment, begin Phase II now (see appendix, page 43).

Materials:

Opening:
(2 min.)

Activity #1:
(6 min.)

Figure: Ways Pesticides Contact Us. Figure: Ways Farmworkers Are Exposed to Pesticides. Pesticide Safety Checklist.

Check progress of Semester-Long Science Experiment. Begin Phase II.

What Are Pesticides/Where Do They Come From? (whole class)

Objective: Students will understand economic relationships and identify examples of the factors of production (land, labor, capital, enterprise).

Procedure: Using the flow chart, "Ways Pesticides Contact Us," begin identifying and defining pesticides as man-made chemicals, produced in factories, used to kill insects and rodents. Refer to the first phase of distribution on the chart, to farmers, ranchers, and others who are involved in the production of food crops. Refer to the parallel phase of distribution to grocery stores and other markets where consumers purchase pesticides for use in their homes and in caring for their lawns and gardens. Emphasize the interrelatedness and the interdependence of each phase to the next, concluding with the recognition that each involvement with pesticides has a direct effect on everyone in the foods we eat and the water we drink. Review the Pesticide Safety Checklist with students.

Activity #2:
(6 min.)

How Are Pesticides Used? (whole class)

Objective: Describe the impact of farm labor and the use of pesticides on the special population of migrant and seasonal farmworkers.

Procedure: Now that we have seen the general role pesticides play in our lives, let's take a look at the specific role pesticides play in the life and work of the farmworker. Using the flow chart, "Ways Farmworkers Are Exposed to Pesticides," illustrate the many opportunities that individual farmworkers have to come into direct contact with pesticides: clearing the land, planting, cultivating crops, harvesting, and packing mature produce for shipping to markets. A farmworker could be exposed to pesticides in each phase of the food-growing process many times a year if he/she stayed on one farm the entire year. However, because of the migratory nature of farm work, farmworkers may be exposed many more times during the year as they travel from region to region and crop to crop.

Activity #3:
(18 min.)

Why Do We Need Pesticides? How Do Pesticides Affect Farmworkers? (whole class)

Objective: Students will compare and contrast opposing viewpoints and interpret visuals.

Procedure: Divide students into teams assigning each a role of pesticide manufacturer, farm owner, farmworker, produce trucking distributor, and grocery store owner. Ask each group to decide from the viewpoint of their occupation whether they are in favor of or opposed to using pesticides in agriculture. Ask them to consider the issue from an environmental impact point of view (effect on water supply, pesticide run-off into lakes, rivers, streams, ocean; long-term health effects, etc.) as well as an economic one. Relate the discussion to past lessons you have conducted on environmental sensitivity and safety.

Closing:
(8 min.)

Make observations based on the lesson activities and the changes in plant growth from the science experiment. What inferences can you make from the chart about plant growth and development? Now that we have begun the next phase of our experiment, what differences do you expect to see among the plants? What have we done in our experiment that might affect the growth of these plants?

FOR THE TEACHER:

Questions to prompt role-play discussion for Activity #3:

- a. What do you need to know to...?
- b. Could you be more specific?
- c. Could you offer a suggestion?
- d. What would you prefer?
- e. What are your suspicions?
- f. What is your objection?
- g. If you could guess at the answer, what would it be?
- h. Can you say that in another way?
- i. What is the worst/best that could happen?
- j. Do any of the rest of you feel the same as...?
- k. What does that suggest to you about...?
- l. What are the options to...?
- m. What changes would you make to this system?
- n. What are the costs? ...the benefits?
- o. If you had it to do over again, what would you do?

PESTICIDE SAFETY CHECKLIST

Before entering fields or yards that have been treated with pesticides, check for the following things:

Are you wearing:

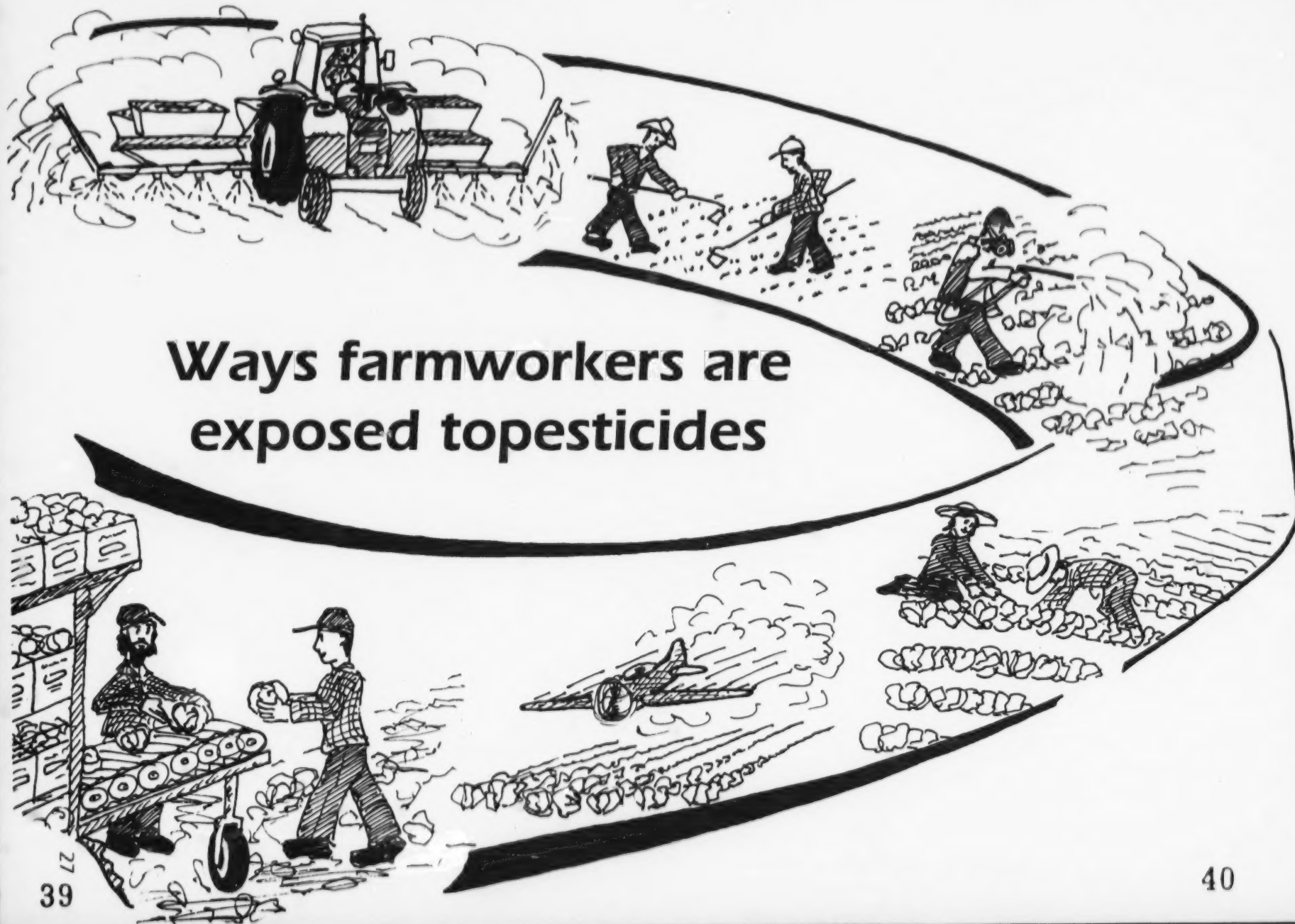
- ☐ Long-sleeved shirt
- ☐ Long pants
- ☐ Socks and shoes (no sandals)
- ☐ Bandana to cover your nose and mouth
- ☐ Hat (one with a wide brim)
- ☐ Gloves

Do you have:

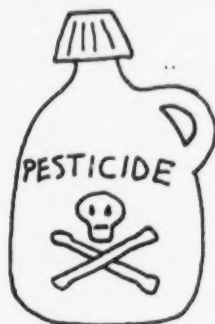
- ☐ Closed container of drinking water
- ☐ Personal food items in coolers or closed containers
- ☐ Information about where to go for help in an emergency
- ☐ Information about when the field was last treated with pesticides

After leaving fields that have been treated with pesticides, do the following things:

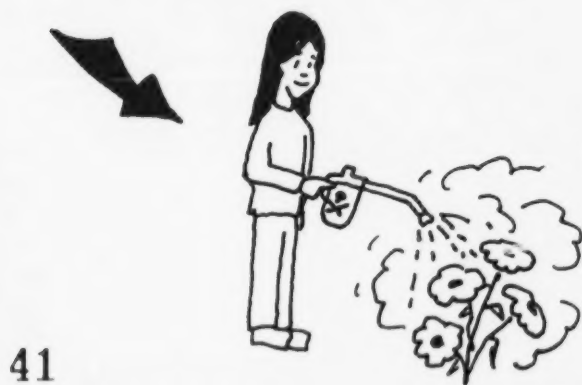
- ☐ Remove clothing, and place in a separate container to be washed with other "field" clothes.
- ☐ Wash, shower, bathe, rinse off; pay special attention to hair, hands, fingernails.
- ☐ Change into clean clothes.



Ways farmworkers are exposed to pesticides



Ways pesticides contact us



LESSON FIVE— PROTECTING OURSELVES FROM PESTICIDES

Content Areas:

Social Studies:

Health:

Learning Objectives:

Describe the impact of farm labor and the use of pesticides on the special population of migrant and seasonal farmworkers; compare and contrast opposing viewpoints; interpret visuals.

Concepts and skills that foster personal health and safety, healthy interaction between individuals, and affect the well-being of people collectively.

Materials:

Bookmarks/stickers showing examples of warning signs in Spanish and English. Sample cleaning or insecticide containers (empty and cleaned) which display warning symbols and messages. Poster, "Be Safe in the Field." Home Safety Checklist for Parents and Children.

Opening:
(3 min.)

Pass out stickers/bookmarks. Ask students to identify the symbols and read the warning signs. Ask students whether they recall seeing any of these symbols/signs from the video, "The Playing Field." Perhaps replay that portion of the video dealing with household sprays, containers, healthy habits.

Activity #1:
(10 min.)

How Do We Identify Harmful Materials? (whole class)

Objective: Students will recognize hazards in the environment and acquire knowledge and skills needed to avoid injury and to prevent accidents.

Procedure: The teacher should display a variety of household products, bug sprays, etc. and ask students to identify each item (guess or read labels) and state its use in the home, yard, garden, garage, etc. Students should be directed to look at the warning symbols on their stickers and compare the symbols to the labels on the products. Discuss the possible danger of combining solvents or chemicals found around the house; e.g. ammonia combined with Comet[®]. Students should be given appropriate emergency procedures to follow in the event someone swallows a dangerous or harmful substance. (Ask students to recall what

Miguel and his mother did in the video). Students should be directed that in the case where someone has swallowed a harmful substance, they should take the container with them, or be able to tell their parents, teachers, or health professionals the name of the product that was ingested.

Activity #2:
(22 min.)

How Do We Protect Ourselves? (whole class)

Objective: Students will recognize the interdependence of people and the environment, and identify personal responsibility for protecting the environment.

Procedure:

a. Allow students an opportunity to discuss feelings associated with being in danger or in a hazardous situation. Review the story in the video and the characters. Play the game, "Round Robin." Students should sit in a circular or semi-circular arrangement. The teacher begins by saying, "When Miguel's sister had to be taken to the hospital, Miguel felt... (or Miguel was worried because...)," and asks one student to complete the sentence. Other questions might be related to how the mother felt, father felt, how the students think the teacher or nurse felt, etc. After a series of similar partial questions, with other students completing the feeling, change to a general discussion of feelings of danger by starting, "If my sister, (brother, mother, father) became ill and I had to take care of them, I would feel..." Ask for concrete feelings about specific events, not general feelings. Reward their willingness to participate by thanking them or by restating what they said in a supportive way. Always allow students to pass their turn if they are not comfortable speaking in a group, but return to them occasionally if they seem ready to participate.

b. Referring to the poster, "Be Safe in the Field," the teacher should ask students to recall the character in the video, Miguel. What sport did Miguel like to play? What did Miguel learn about pesticides and playing in the fields? What did Miguel and his family learn about how people who work in agricultural fields should protect themselves from pesticides? Review some of the behaviors suggested in the video: Wear long-sleeve shirts, long pants, gloves; don't reuse containers; wash clothes separately; make sure waste water drains away from the house and away from any play areas, etc.

Closing:
(5 min.)

Should we stop eating food because it has been sprayed with pesticides? What are some of the alternatives we can use to protect ourselves from things in our environment that might be harmful, while still maintaining good health and eating habits?

Who is responsible for our health and for the health and well-being of our families and friends?

IN CLASS ASSIGNMENT
OR HOMEWORK:

Have the students compile a list of substances which emit strong fumes; e.g., gasoline, paint thinner, glue, hair spray, insecticides, household cleaning agents, etc.

HOMEWORK:

Have each student take a copy of the Home Safety Checklist. Students and their parents should fill out the list and the student should return the completed form to the teacher. Have students design their own labels for poisonous or dangerous substances.

HOME SAFETY CHECKLIST FOR PARENTS AND THEIR CHILDREN

Dear Parent(s)/Guardian(s):

We are learning about home safety and how to store potentially dangerous products so that young children are protected. Please help your child complete this checklist and have him or her bring it back to school for discussion during tomorrow's class. It is to show that each child has helped his or her family inspect all the storage areas. This will also be a good opportunity for a review of house plants that are hazardous to eat or handle.

Here are the places I am supposed to help my family look to see that all poisonous products are safely stored:

Bathroom	Dining Area
Bedroom	Garage
Kitchen	Yard
Living Room	Utility Areas
Closets	Others

We are to look especially for these things:

Kerosene/gasoline	Detergents
Aspirin	Polishes
Sleeping pills	Ant/rat poison
Adult vitamins	Drain cleaners
Disinfectants	Moth balls
Fertilizers	Pesticides
Paint remover	Lye/bleaches
Turpentine	Any dangerous sprays

Now our home should be safer for me and my entire family.

Parent's name: _____

Student's name: _____

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"THE PLAYING FIELD" EVALUATION FORM

Please take a moment to give us your comments regarding the lesson plans, activities, or visual materials contained in this curriculum guide. Please identify the subject area(s) and grade level for each response:

1. Of the materials on safety rules for contact with pesticides or dangerous chemicals, which activities and/or materials were most useful?
2. Of the materials on occupational and cultural aspects of migrant and seasonal farmworkers and their families, which activities and/or materials were most useful?
3. Of the materials on U.S. geography, the agricultural industry, and economic relationships, which activities and/or materials were most useful?
4. If the Curriculum Guide contains materials and/or activities which were not useful, please list them below:
5. If you noted any errors that should be corrected, please list them below:
6. Do you have any suggestions for items that should be added?
7. Other comments (use the back of this page or a second sheet if necessary):

PLEASE RETURN TO: NATIONAL MIGRANT RESOURCE PROGRAM, INC.
1515 Capital of Texas Hwy. South, Suite 220
Austin, Texas 78746
Attention: Deliana Garcia

FROM: Name: _____
School: _____
Address: _____
City/State/Zip: _____
Telephone: _____

APPENDICES

QUESTIONS

NOTE TO TEACHER: These questions can be used to lead classroom discussions, or as a general assessment tool to gauge your students' prior knowledge of agricultural issues against the effectiveness of the lessons provided in this curriculum guide. Suggested answers are provided following the questions. Some questions are open-ended and lend themselves more to discussion than others. Please feel free to pick and choose test questions in order to meet your students' needs and grade level.

PRE-TEST/POST-TEST:

1. What is a farm?
2. What are some examples of farm work?
3. Name six different fruits and vegetables that migrant workers pick?
4. Name five different steps involved in growing fruits and vegetables from seedlings to maturity.
5. Can farm work be dangerous?
6. Name three possible dangers that migrant farmworkers face.
7. Who does farm work?
8. Name three things that might keep a migrant farmworker from being able to work every day of the year.
9. What do farmworkers do when it rains, or when they cannot work in the fields?
10. Are migrant farmworkers only Hispanic/Latino?
11. What language(s) do migrant farmworkers speak?
12. How do migrant and seasonal farmworkers travel?
13. What does it mean to migrate?
14. What is meant by seasonal?
15. How do you think migrant children have fun?
16. Where/how do you think migrant children go to school?
17. If farm owners do not provide housing, where do you think migrant workers live?

18. Can you describe what a migrant farmworker camp/home might look like?
19. What are some of the advantages of being a migrant farmworker? Disadvantages?
20. When migrant workers get too old to work, how do they support themselves?
21. Why are migrant and seasonal farmworkers important to our lives in the United States?

ANSWER KEY:

1. A large piece of agricultural land, devoted to the cultivation and harvesting of vegetables or the raising, breeding or production of a specific animal.
2. Examples of farm work are: driving a tractor, picking rows of vegetables, packing vegetables in crates/loading onto trucks; feeding animals and cleaning shelters; pruning trees; preparing the ground, planting seeds, weeding.
3. Fruits and vegetables that migrant workers pick include: cherries, apples, peaches, strawberries, blueberries, pears, bananas, pineapples, oranges, lemons, limes, grape-fruits, kiwi, grapes, raspberries, apricots, plums; all kinds of peppers: chili, bell, jalepeno, serrano, etc.; melons: watermelons, honeydew, canteloupes, pumpkins; lettuce, tomatoes, cucumbers, cabbage, beets, broccoli, spinach, squash, mushrooms, onions, potatoes, corn, carrots; grains: wheat, soybeans, peas, rice, oats, milo, sorghum, alfafa.
4. Five steps to food production: clearing soil, planting, weeding, watering, spraying for insects with pesticides, harvesting, and cleaning.
5. Yes. (Any work can be dangerous if proper precautions are not taken).
6. Possible dangers include: illnesses due to outdoor exposure and weather: heat stroke, insect bites, fatigue. Muscle strain and physical injury due to heavy labor, arthritis; farm equipment accidents and injuries.
7. Anyone and everyone can do farm work.
8. The seasons of the year do not allow fruits and vegetables to be picked all year long in every region of the United States; if a farmworker does not have transportation or the money to pay for transportation to travel where work is available; illnesses and injuries could hinder someone's ability to work; too many people needing work and not enough work for everyone in a specific region.
9. Depending on the nature of the work, some farm labor can be conducted in bad weather conditions. Otherwise, farmworkers must wait until the weather is clear, and not be paid while they are waiting for conditions to improve.
10. Migrant and seasonal farmworkers are people of all ethnic backgrounds from all over the world. Asians, Native Americans, Latinos, African-Americans, Euro-Americans.

11. Most migrant farmworkers speak English as well as another native language if it is not English, such as Creole, Spanish, Chinese, Japanese, Russian, Vietnamese, Native-American languages, etc.
12. Migrant and seasonal farmworkers travel by bus, car, plane, or truck to find work.
13. To migrate: to move from one region to another within a country; to change location periodically, usually depending on the yearly seasons.
14. Seasonal refers to the four weather periods of the year: summer, winter, fall, spring; and to dry and rainy growing periods.
15. Migrant children have fun the way all children have fun: playing games, being with friends, reading, etc.
16. Migrant children attend schools in rural areas, near where their parents are working; they arrive by school bus, by car, or by walking. Often migrant children must change schools several times during the year, in order to stay with their families.
17. Sometimes farmworkers can be considered homeless, if they have no housing provided by their employer. They may live in cars and trucks or in lean-to temporary shelters in the open air until they can move to more permanent housing.
18. In some regions, it is common for groups of men to travel, work, and live together away from their families. When families travel together, several families will live together in migrant labor housing; sometimes men are assigned to separate housing from women and children. There is usually one kitchen for several families to use, and limited indoor and outdoor bathroom facilities. In many cases, the building material used to make farmworker housing is not very durable and deteriorates rapidly. Some farmworkers live in trailers or campers.
19. Advantages: Work outside, travel to different parts of the country, work as much or as little as needed to provide for yourself. Disadvantages: No sick leave, vacation time, or health insurance provided by employer; very low wages; difficult to predict future work or earnings; health hazards, illnesses, injuries.
20. Because of low wages, and the nature of farm work, few farmworkers will have social security benefits from which to retire. They will have to save earnings throughout their working life, or rely on family members to support them.
21. Without the work of migrant and seasonal farmworkers, the cost of food would be too expensive for many people to buy. We would not have the quantity and variety of fruits and vegetables available to us in the grocery stores if each of us had to buy our food directly from farmers in our area. Food does not grow well in certain parts of the country (mountains, deserts), so people who lived there would have to travel great distances to obtain food.

DEFINITIONS

Agriculture: Food growing, planting, harvesting, not to include fishing, lumber, dairy, cattle, or poultry industries.

Cultivate: To improve and prepare land, by plowing or fertilizing, for raising crops; to till. To loosen or dig soil around growing plants; to tend a plant or crop; nurture.

Farmer: Someone who owns land on which fruit or vegetable crops are grown for public distribution and consumption; grower.

Farmworker: Someone who is paid earnings by a landowner for planting, cultivating, growing, and harvesting fruit and vegetable crops for commercial distribution and use.

Harvest: The act or process of picking or gathering a crop. The amount of crop gathered; yield. The time or season for gathering a certain crop.

Migrant farmworker: Someone whose work is in food growing, harvesting, planting, and who establishes a temporary residence in a variety of locations throughout the year in order to have work. Also known as migratory agricultural worker or migrant laborer.

Pesticides: Chemical powder or spray that is used on plants, fruits, and vegetables that kills insects; can be harmful to people if swallowed or exposed to in certain quantities.

Piece work: Work paid for according to the number of products turned out. In farm labor, number of pounds, bushels or crates of crops picked, as opposed to work paid for by the hour.

Season: One of the four natural divisions of the year, spring, summer autumn, and winter indicated by change in weather and intensity of the sun. In tropical climates, the two divisions of the year, rainy and dry. Also refers to phases in growing cycle.

Seasonal farmworker: Someone who maintains a permanent residence, but works in several industries on a seasonal basis; in agriculture, during a recurrent period of time from planting to harvesting, when the food is available for picking or ready to be eaten.

Streams: Major routes regularly traveled by farmworkers seeking seasonal jobs; e.g., Western Stream, California to Washington State/Idaho; Midwest Stream, Texas to Montana/ Minnesota; Eastern Stream, Florida to New York/Michigan.

Worker Protection Standards: Rules, regulations, and policies established by the U.S. Environmental Protection Agency and provided for the protection and safety of agricultural and other industrial workers in the United States.

SEMESTER-LONG SCIENCE PROJECT

Objective:

Students will observe phenomena resulting from life, the earth, physical sciences, and the environment; predict outcomes, make inferences about possible changes that occur to organic objects in the environment.

Length/Time:

Depending on whether you have an outdoor garden or conduct this as an in-class experiment will influence the amount of time for this project. Students can use the tables on page 45 to chart the growing process over a six-week or six-month period.

(If your school has an outside area that could be used as a "class garden," students could be assigned an area in which to grow three groups of the same vegetable. If there is not enough space for a garden, use the materials and follow the procedures below.)

On-Going Experiment: Phase I**Materials:**

Enough plastic cups (6" tall) for each student to have three; potting soil; vegetable seeds (GREEN BEANS and/or SUNFLOWER SEEDS); student charts (one sheet containing three charts is provided at the end of this lesson). The chart can be photocopied and distributed to each student. One sheet should be used for Phase I, and one sheet should be used for Phase II.

Activity:

Comparison of seed sprouting time and plant growth, keeping variables equal.

Procedures:

Have each student plant vegetable seeds in each of the three cups in potting soil, and expose seeds to equal ranges of light, temperature, and moisture. A variety of seeds can be used, but the type of plant chosen should be constant. That is, one student could have three cups each filled with green bean seeds, while another student would use only sunflower seeds; not a mixture of the two. Each student will chart light, temperature, water (amount and frequency), and time it takes for seeds to sprout. Once seeds have sprouted, each student should chart growth rate and size (keeping plants growing until time for Phase II, see Lesson Four).

On-Going Experiment: Phase II

Procedures:

Assuming that the seeds planted in the flower pots have had ample time to sprout and begin leafing, and that all variables have been kept constant (light, water, soil), make appropriate entries on the chart for height, color, number of leaves, etc. Choose one plant to be the receiver of the treatment, allowing the other to act as control. Continue to keep light and water variables constant, but apply equal doses of chemical pesticide such as Malathion or Diazonon to the other, continuing application each day. The third plant should be treated with organic, biodegradable pest deterrents (such as Sevin dust or Safer insecticide soap). Continue making entries on the class chart for each of the three plants, noting differences between the treatment plant(s) and the control plant(s).

WORKSHEET FOR SCIENCE EXPERIMENT

Week:	Hrs. of Light	Temp.	Water (Amount)	Seed(s) Sprouted	Growth Size	Leaf Color

Student Name: _____

Name of plant: _____

Chart for Plant #1 #2 #3 (circle one)

Week:	Hrs. of Light	Temp.	Water (Amount)	Seed(s) Sprouted	Growth Size	Leaf Color

Student Name: _____

Name of plant: _____

Chart for Plant #1 #2 #3 (circle one)

Week:	Hrs. of Light	Temp.	Water (Amount)	Seed(s) Sprouted	Growth Size	Leaf Color

Student Name: _____

Name of plant: _____

Chart for Plant #1 #2 #3 (circle one)

OTHER SOURCES OF INFORMATION

U.S. Environmental Protection Agency
Occupational Safety Branch
MS H7506C
401 M Street, S.W.
Washington, DC 20460
(703) 557-7666 or (703) 305-7666

Poison Control Centers
Northwest Texas Hospital
Box 1110
Amarillo, TX 79175
(800) 692-1331

National Migrant Resource Program Inc.
1515 Capital of Texas Hwy. South, Suite 220
Austin, Texas 78746
(512) 328-7682 or (800) 531-5120

Comite de Apoyo a los Trabajadores Agricolas (CATA)
P.O. Box 458
Glassboro, NJ 08028
(609) 881-2507

Farmworker Justice Fund, Inc.
2001 "S" Street, N.W., Suite 210
Washington, DC 20009
(202) 462-8192

Migrant Legal Action Program (MLAP)
Bea Bobotek
2001 South Street, NW, Suite 310
Washington, DC 20009
(202) 462-7744

Association of Farmworker Opportunity Programs (AFOP)
1925 North Lynn Street
Arlington, VA 22209
(703) 528-4141

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- Ashabanner, Brent K. **Dark Harvest: Migrant Farmworkers in America.** New York: Dodd Mead, 1985.
- Delgado, Concha. **Cesar Chavez, Apostle of Non-Violence.** Berkeley, CA: BABEL Productions, 1971.
- Levy, Jacques E. **Cesar Chavez: Autobiography of La Causa.** New York: Norton, 1975.
- Kafka, Sherry and Coles, Robert, eds. **I Will Always Stay Me: Writings of Migrant Children.** Austin, TX: Texas Monthly Press, 1982.
- Steinbeck, John. **The Harvest Gypsies: On the Road to the Grapes of Wrath.** Berkeley, CA: Heyday Books, 1988.
- Steinbeck, John. **Their Blood is Strong.** San Francisco: Simon L. Lubin Society of California, 1938.
- Taylor, Florence W. and Overlie, George. **The School Picnic.** Minneapolis: Lerner Publications, 1971.
- Weiner, Sandra. **Small Hands, Big Hands: Seven Profiles of Chicano Migrant Workers and their Families.** New York: Pantheon Books, 1970.

FOR FURTHER RESEARCH:

- Coles, Robert. **Uprooted Children: The Early Life of Farmworkers.** Pittsburgh: University of Pittsburgh Press, 1970.
- Emmet, Herman LeRoy. **Fruit Tramps: A Family of Migrant Farmworkers.** Albuquerque: University of New Mexico Press, 1989.
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- Heaps, Willard Allison. **Wandering Workers: The Story of America's Migrant Farm Workers and Their Problems.** New York: Crown Publishers, 1968.
- Hintz, Joy. **Poverty, Prejudice, Power, Politics: Migrants Speak About Their Lives.** Columbus, OH: Avonelle Associates, 1981.

Holland, Ruth Robins. **The Forgotten Minority: America's Tenant Farmers and Migrant Workers.** New York: Macmillan, 1970.

National Advisory Council on Migrant Health. **1993 Recommendations of the National Advisory Council on Migrant Health.** Rockville, Maryland: National Advisory Council on Migrant Health, May 1993.

Wilkinson, Alec. **Big Sugar: Seasons in the Cane Fields of Florida.** New York: Knopf, 1989.

TOP THREE CROPS FOR EACH STATE BY CASH RECEIPTS, 1991

State	#1 Crop	#2 Crop	#3 Crop
Alabama	Peanuts	Cotton	Soybeans
Alaska	Hay	Potatoes	Barley
Arizona	Cotton	Lettuce	Hay
Arkansas	Soybeans	Rice	Cotton
California	Grapes	Cotton	Tomatoes
Colorado	Corn	Wheat	Hay
Connecticut	Tobacco	Hay	Apples
Delaware	Soybeans	Corn	Potatoes
Florida	Oranges	Tomatoes	Cane
Georgia	Peanuts	Cotton	Tobacco
Hawaii	Cane	Pineapples	Macadamia Nuts
Idaho	Potatoes	Wheat	Sugarbeets
Illinois	Corn	Soybeans	Wheat
Indiana	Corn	Soybeans	Wheat
Iowa	Corn	Soybeans	Hay
Kansas	Wheat	Corn	Sorghum
Kentucky	Tobacco	Soybeans	Corn
Louisiana	Cotton	Cane	Soybeans
Maine	Potatoes	Apples	Blueberries
Maryland	Soybeans	Corn	Wheat
Massachusetts	Cranberries	Apples	Tobacco
Michigan	Corn	Soybeans	Apples
Minnesota	Corn	Soybeans	Sugarbeets
Mississippi	Soybeans	Rice	Corn
Missouri	Soybeans	Corn	Cotton
Montana	Wheat	Barley	Hay
Nabraska	Corn	Soybeans	Sorghum
Nevada	Hay	Potatoes	Wheat
New Hampshire	Apples	Hay	Maple Products
New Jersey	Peaches	Blueberries	Soybeans
New Mexico	Hay	Chili Peppers	Onions
New York	Apples	Hay	Corn
North Carolina	Tobacco	Soybeans	Corn
North Dakota	Wheat	Barley	Sunflower
Ohio	Soybeans	Corn	Wheat
Oklahoma	Wheat	Cotton	Peanuts

State	#1 Crop	#2 Crop	#3 Crop
Oregon	Wheat	Hay	Potatoes
Pennsylvania	Mushrooms	Hay	Apples
Rhode Island	Potatoes	Apples	Hay
South Carolina	Tobacco	Cotton	Soybeans
South Dakota	Corn	Soybeans	Wheat
Tennessee	Tobacco	Cotton	Soybeans
Texas	Cotton	Corn	Sorghum
Utah	Hay	Wheat	Cherries
Vermont	Hay	Maple Products	Apples
Virginia	Tobacco	Soybeans	Peanuts
Washington	Apples	Wheat	Potatoes
West Virginia	Apples	Hay	Tobacco
Wisconsin	Corn	Potatoes	Hay
Wyoming	Sugarbeets	Hay	Barley

Compiled from: Strickland, Roger P.; Johnson, Cheryl; and Williams, Robert P. **Ranking of States and Commodities by Cash Receipts, 1991**. Statistical Bulletin no. 848. Washington, DC: U.S. Department of Agriculture Economic Research Service, November 1992.



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